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We claim:

1. A method for assessing predisposition of a subject to a mental disorder phenotype having an association with an at-risk allele of a brain-functional gene having a plurality of alleles, the association being conditioned by a pathogenic environmental risk factor status condition, the method comprising the steps of

determining whether the subject carries one or more copies of an at-risk allele;

determining whether the subject has experienced, or is at risk of experiencing, the environmental risk factor; and

concluding that the subject is predisposed to the phenotype if the subject carries the at-risk allele and has experienced, or is at risk of experiencing, the environmental risk factor.

2. The method of claim 1 wherein the subject carries the at-risk allele.

3. The method of claim 1 wherein the subject has experienced, or is at risk of experiencing, the environmental risk factor.

4. The method of claim 1 wherein the at-risk allele is selected from an allele of a gene expressed in a cell type known to act in the brain, a gene associated with variation in size of a brain structure, a gene associated with concentration of a neurotransmitter in the brain, a gene associated with a brain response to a stimulus as assessed by an imaging method, and a gene which when altered affects behavior of a human or non-human animal.

5. The method of claim 1 wherein the at-risk allele is an allele characterized by a short promoter allele of a 5-HTT gene.

6. The method of claim 1 wherein the mental disorder phenotype is selected from the group consisting of a behavioral disorder phenotype, an emotional disorder phenotype, and a cognitive disorder phenotype wherein genetic variation in a population accounts for a high or very high proportion of total phenotypic population variation.

7. The method of claim 1 wherein the disorder phenotype is antisocial behavior disorder.

8. The method of claim 1 wherein the disorder phenotype is depression.

9. The method of claim 1 wherein the pathogenic environmental risk factor is selected from the group consisting of exposure to psychological trauma, exposure to psychosocial stress, exposure to an unhealthy diet, an infectious agent, exposure to a toxic agent, experience with a pharmacological agent, a medical trauma, and an injury.

10. The method of claim 1 wherein the pathogenic environmental risk factor is childhood maltreatment.

11. The method of claim 1 wherein the pathogenic environmental risk factor is a plurality of stressful life events.

12. The method of claim 1 wherein the at-risk allele is an allele characterized by a short promoter of a 5-HTT gene, the mental disorder phenotype is depression and the pathogenic environmental risk factor is a plurality of stressful life events.

13. The method of claim 1 wherein the step of determining whether the subject carries one or more copies of the at-risk allele comprises the steps of:

amplifying a portion of the gene using an amplification primer pair that distinguishes the at-risk allele from other alleles of the gene; and

determining whether the amplified portion is a fragment of the at-risk allele.

14. The method of claim 13 wherein the at risk allele is selected from an allele of a gene expressed in a cell type known to act in the brain, a gene associated with variation in size of a brain structure, a gene associated with concentration of a neurotransmitter in the brain, a gene associated with a brain response to a stimulus as assessed by an imaging method, and a gene which when altered affects behavior of a human or non-human animal.

15. The method of claim 13 wherein the at-risk allele is an allele characterized by a short promoter allele of a 5-HTT gene.